

## National Ignition Campaign

One of the Grand Challenges in science and engineering is the demonstration of inertial confinement fusion (ICF) – net energy gain through fusion ignition – in the laboratory. Lawrence Livermore National Laboratory, in collaboration with its partners in the National Ignition Campaign (NIC) – Los Alamos and Sandia National Laboratories, the Laboratory for Laser Energetics at the University of Rochester and General Atomics of San Diego – will tackle this challenge with ignition experiments on the National Ignition Facility beginning in 2010. NIC is the “bridge” that will take NIF to routine operations as a highly flexible, high energy density science facility by 2013.

NIC’s ICF experiments will be designed to advance the National Nuclear Security Administration’s Stockpile Stewardship Program as well as basic high energy density science

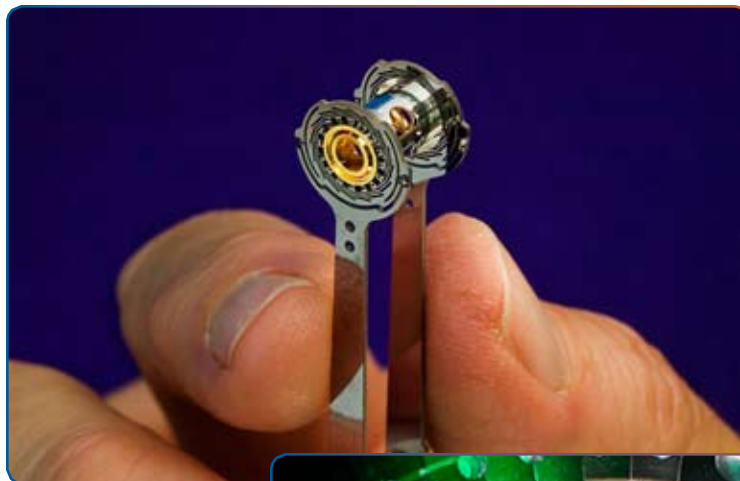
research in such fields as astrophysics, nuclear physics, radiation transport, materials dynamics and hydrodynamics. Other experiments will provide scientists with the necessary understanding of the physics underlying the use of ICF for safe, clean energy production.

NIC includes all of the experiments, hardware and infrastructure needed to execute the initial ignition experiments and to continue research on ignition in the following years. Key elements of NIC include target physics concept validation and equipment such as diagnostics and the cryogenic target system required for ignition experiments.

Target designs have been developed that are calculated to ignite at a laser energy as low as one megajoule. Research using the OMEGA laser at the University of Rochester has validated these designs. Development of manufacturing capability for

producing these targets to the required tolerances is well under way. Diagnostics and other support equipment are being designed and fabricated. NIC is on target to begin ignition experiments in 2010. ■

A NIF Hohlraum



Interior of the NIF Target Chamber



### **Inside The Target Chamber**

A technician inspects  
the Target Positioner,  
which holds the NIF  
target in the precise  
spot where all 192 laser  
beams converge.

